calculated to offend the sensibilities of the public avoided in so far as may be practicable. In other words, more progress will be made in the end by gaining the confidence and arousing the interest of the public, and thereby enlisting their cooperation, than by causing widespread antagonism in the prosecution of an ideally satisfactory campaign for suppression. In the case of the ordinary communicable diseases, like typhoid fever and tuberculosis, the problem is much simpler, yet progress is slow and well-established measures of control are tardily accepted.

In dealing with the problem of syphilis, on the other hand, we encounter not only ignorance but also a formidable array of erroneous fixed ideas and deeply rooted prejudices which can not be presently eradicated by the mere marshaling of scientific facts, no matter how cogently presented. Much tact, therefore, will be needed and much restraint must be exercised lest we seriously damage the cause we are advocating by urging radical reforms for which the public is not yet prepared.

PRESENT-DAY CONTROL OF DRUGS AND MEDICINES.

THE VARIATION IN PURITY AND STRENGTH OF WIDELY USED DRUGS AND PREPARATIONS A VEXATION TO THE PHYSICIAN AND A MENACE TO THE PATIENT.

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In connection with the several Hygienic Laboratory Bulletins containing a Digest of Comments on the Pharmacopœia of the United States of America and on the National Formulary, an attempt has been made to reflect the activities of Federal and State laboratories in so far as these activities relate to the enforcement of pure-drug laws, and also to review at some length the reports from other chemical laboratories in which pharmaceutical investigations are being made.

As has been pointed out before by the writer, the available reports from State and other laboratories show that the enforcement of State food and drug laws is far from being consistent and is certainly not persistent. The paucity of these reports also serves to emphasize the risk of placing too much reliance on what can be accomplished by State control alone without putting a proper amount of responsibility for the purity and strength of medicines where it rightfully belongs—on the pharmacist or druggist who sells or dispenses the medicine.

The limitations imposed by our present methods of enforcing the several laws designed to improve the nature and purity of products sold as medicine have been commented on at various times, and the available reports clearly indicate that the amount of work done is altogether inadequate to safeguard the consumer.

James H. Wallis, a former food and drug official, in commenting on the evident shortcomings of our present-day control of foods and drugs, recently expressed the belief[1] that the chief reasons why this work has not been more effective are the lack of cooperation between food and drug officials and insufficient educational work.

The need for systematic educational work is evidenced by the fact that any efficient control of drugs and medicines involves the expenditure of considerable sums of money. The necessary appropriations for work of this kind are not likely to be forthcoming unless the need for the work is recognized and practically indorsed by the people at large.

The following table showing the total number of drugs examined and rejected by five State laboratories serves to show the extent to which control work of this kind has been developed up to the present time. The five States enumerated in the table are undoubtedly the leaders in food and drug law enforcement and may well serve as models for others to conform to.

Table showing the total number of samples of drugs examined and rejected, reported from five State laboratories during 1914.

Author.	State.	Number of samples examined.	Number of samples rejected.	Per cent of samples rejected.
Barnard, H. E	Indiana	399	142	35.5
Newcomb, G. D	Iowa	116	35	30.2
Lythgoe, H. C	Massachusetts	1,393	204	14.6
Congdon, Leon A	Kansas	393	207	52.7
Todd, R. A	Michigan	571	214	37.5
Total		2,872	802	27.8

The information suggested in the above table is further emphasized by the following table compiled from reports quoted in Hygienic Laboratory Bulletin No. 105.[2]

The information presented in these compilations serves to suggest why medicines, when given for their physiologic effect, are frequently disappointing in that the expected results fail to manifest themselves, or the reverse; that moderate and even supposedly small doses of a preparation produce unexpected, and at times marked, secondary manifestations of drug intoxication.

[1] Pac. Pharm., 1914, v. 7, p. 283; also Drug. Circ., 1914, v. 58, p. 97.

[2] Digest of Comments on the Pharmacopœia of the United States of America and on the National Formulary for the calendar year ending December 31, 1914.

Table showing the number of samples of widely used drugs and preparations reported on by State and other chemists during 1914.

	Number of reporters.	Total number of samples.	Number of samples rejected.	Approximate per cent of rejected samples.
Ammonia water	4	76	46	62.1
Aspirin tablets	6	79	36	45.5
Bay rum	5	33	16	48.4
Diluted hydrochloric acid	4	155	98	63.2
Distilled extract of witch-hazel	5	72	13	18.0
Honey	6	108	9	8.3
Camphor liniment	8	234	99	41.4
Extract of lemon	5	222	69	30.5
Lard	8	215	95	44.2
Lime water	5	108	21	19.4
Oil of turpentine	8	234	25	10.7
Oil, linseed	8	123	60	48.7
Oil, olive	13	460	121	26.3
Solution of hydrogen peroxide	14	252	45	17.8
Solution of potassium arsenite	8	174	101	58.1
Spirit of camphor	16	906	314	34.6
Spirit of nitrous ether	14	400	245	61.2
Spirit of peppermint	15	476	264	55.4
Sirup of ferrous iodide	5	99	31	31.2
Tincture of aconite	3	138	73	52.1
Tincture of belladonna	6	172	133	77.3
Tincture of ferric chloride	8	193	101	52.3
Tincture of ginger	5	46	28	60.8
Tincture of iodine	14	1,042	475	45.5
Tincture of opium	7	141	31	21.9
Tincture of vanilla	6	188	46	24.4
Zinc ointment	4	18	8	44.4

Articles that during recent years have been frequently examined and reported on, like lime water, solution of hydrogen peroxide, and distilled extract of witch-hazel, appear to be of much better quality than in former years. Some few articles, like tincture of iodine, solution of potassium arsenite, and spirit of nitrous ether, despite the fact that they have been frequently reported on as being below standard, are even now found to be below standard and of poor quality. Comparatively important preparations, like tincture of aconite and tincture of belladonna, have also been found to be unreliable or not in accord with the official requirements.

This variation from the established standard is particularly significant in that it involves preparations that are more than ordinarily potent and which because of their potency may and not infrequently do produce untoward results.

The possibilities in this direction are perhaps best illustrated by the supposition that a physician may for some time have dispensed a preparation that was 20 or more per cent below standard and suddenly, without his knowledge, have substituted for this weak preparation a tincture that is 30 or more per cent above the established requirements. A variation of 50 per cent or more in the dose of so potent a preparation as tincture of aconite or tincture of belladonna, when the preparation is already being given to the limit of tolerance, might, and undoubtedly would, be followed by pronounced and possibly serious symptoms of drug intoxication.

The naturally occurring variation in the nature and composition of widely used vegetable drugs is well illustrated by the following table showing the variation in purity or value of a number of drugs reported on during the year 1914.

Table showing the variation in purity or value of a number of drugs reported on during the year 1914.

	Number of reporters.	Number of samples.	Variation in reported findings.
Aconite	6	41	0.24 to 0.884 per cent of alkaloidal principle.
Asafetida	8	177	1.60 to 75.06 per cent of ash.
Belladonna leaves	5	63	0.03 to 0.608 per cent of alkaloids of belladonna.
Hydrastis	5	39	1.96 to 4.21 per cent of hydrastine.
Hyoscyamus	5	49	0.004 to 0.11 per cent of mydriatic alkaloids.
Ipecac	7	82	0.823 to 2.56 per cent of alkaloids.
Jalap	6	54	3.30 to 14 per cent of resin.
Lupulin	5	42	2.4 to 49.07 per cent of ash.

The available data regarding the fluctuations in the purity, nature and composition of widely used drugs suggest at least that much of the supposed variability in the action of drugs on the animal organism can be accounted for in this way rather than by the assumption of idiosyncrasy or special susceptibility on the part of patients themselves.

That the problems involved in any form of adequate control of the medicine supply business are far from solved in an effectual way by the furnishing of a guarantee by the wholesale dealer or the manufacturers is evidenced by the generally accepted statement that once a seal is broken, a package opened, or a cork drawn the wholesale dealer or the manufacturer can no longer be held responsible for the contents of the package and the pharmacist or dispenser must assume all responsibility for the nature and purity of the article.

The possibilities of deterioration due to any one of a number of possible factors or combination of factors are now generally recognized. As yet little or no concerted effort has been made to improve on existing conditions, largely because the underlying causes are of such a far-reaching nature as to require radical changes in our present-day methods of supplying drugs to the consumer.

The chemist for the Massachusetts State board of health is quoted as saying that it has been shown that the larger amount of adulteration and substitution is practiced by the small dealer. While the word "adulteration" may not properly represent the conditions as found it is in a general way, undoubtedly, true that materials purchased in a small way from retail dealers are more frequently below standard than are the same drugs or preparations purchased from a wholesale dealer or direct from the manufacturer.

A chemist for one of the larger chemical manufacturing houses repeatedly pointed out that one of the greatest laxities in the handling of drugs lies in the use of poor containers, and investigations that have been made under the auspices of State food and drug chemists have shown without a doubt that pharmacists are not only careless in the method of storing perishable drugs and preparations but that the weights and measures found in their stores are frequently far from standard. This combination, poor container, imperfect storage, and nonstandard weights and measures is quite sufficient to explain the reason why on analyses, preparations purchased from retail druggists are frequently found to be far from standard and appear to indicate gross carelessness or crass ignorance in their making.

Theoretically a drug store should be a place where nothing is obtainable but drugs of standard quality and where all activities and energies, all the thoughts of the owners and employees are devoted to this one object.

In the average drug store, with its many and varied so-called side lines, little or no attention can be given to the systematic control of even the more frequently used drugs and preparations, and practically no supervision is exercised over the less frequently used drugs or preparations which are seldom called for. The systematic inspection of drug stores in this country is as yet not at all developed, though a beginning has been made in at least several States. The food and drug commissioner of Georgia in commenting on existing conditions asserts that the drug inspectors and commissioners are powerless to carry on their work unless supported by druggists themselves. The officials are willing enough to make drug-inspection work as real and efficient as is indicated by the support given by retail druggists or the people at large.

In conclusion it may be said that the laws designed to regulate the practice of pharmacy and to restrict the distribution of potent drugs to specially trained and capable individuals are ineffective and sadly out of keeping with the present-day needs. These laws were enacted 20 or more years ago to comply with the average requirements then evidenced and have done much to hamper the general progress of pharmacy in a way that would make pharmacy be of service to the people or a safeguard to the public health.

Efficient and active control of drugs and their preparations can be exercised only by the dispenser or distributor of medicines to the consumer. The activities of the State officials should be developed to provide for the systematic inspection of drug stores or dispensaries, thus insuring a more comprehensive and systematic control of all of the drugs and preparations on hand. A more intensive and more comprehensive enforcement of existing laws would tend to bring about the necessary changes in the drug and medicine business, and thus make of it what it should be, a guardian of the public health.